SmartWay Transport Partnership Shipper Tool Peer Review
Response to Comments and Final Report

EPA SmartWay is in the process of enhancing its assessment and tracking tools for SmartWay partners to calculate annual fuel usage and emissions. Tools are being developed for trucking carriers and shippers to use to calculate the emissions of their shipping operations overall. In the future, EPA could develop carrier tools for other modes.

These enhanced tools will replace the Freight Logistics Emissions and Efficiency Tool (FLEET) that carrier partners have used since SmartWay's inception. The FLEET tools provided an index of the partners' operating efficiencies based upon adopting technical and behavioral measures to save fuel and improve efficiency. As with the FLEET tool, the enhanced tool will assist carriers in understanding environmental and fuel consumption performance. Unlike the FLEET tool, which assigned carriers a non-dimensional rating of relative performance, the enhanced tools enable carriers to express performance as an emission metric rather than an indexed factor. These new tools address the evolving needs of SmartWay partners for environmental and carbon accounting. This includes the needs of carriers to respond to multiple shipper customer requests for carbon accounting, and the need for shipper partners to do such accounting across their entire supply chains. The enhanced tools will allow shippers and carriers to use a single, consistent, integrated assessment and tracking reporting approach.

The peer review process helps EPA ensure that the Agency's scientific and technical products are of the highest quality. SmartWay is submitting the enhanced tools to panels of independent experts on supply chain management and on operations. This peer review is part of a broader process in developing the tools, which included informal discussions with stakeholders, and beta testing.

The Shipper Tool was the second of the tools submitted for peer review. This report summarizes the results of that review and EPA's response to the reviewers' comments. The SmartWay 2.0 Shipper Tool was sent out for peer review on October 15, 2010, to the following individuals:

- Edgar Blanco, Massachusetts Institute of Technology
- Paul Dittmann, The University of Tennessee
- Cristiano Facanha, The International Council on Clean Transportation (ICCT)
- Susan Golicic, Colorado State University
- Jason Mathers, Environmental Defense Fund (EDF)

Reviewers were invited to comment on all aspects of the model, but in particular, their charge asked them to address the following specific questions:

1. Does the tool collect sufficient data to develop credible, robust CO_2, PM, and NO_x emission inventories from SmartWay shippers' rail and truck freight movements? Does the tool

provide sufficient outputs to help SmartWay shippers track their emissions performance over time? Are there other data, or ways of organizing the data, you believe would help shippers better manage their energy, GHG, or air quality performance? Can the tool be improved in any way to better assist shippers with emissions performance benchmarking and reduction analysis?

Reviewer 1: It appears that every reasonable attempt has been made to gather credible data. You have an impressive list of data sources. Of course the data does have limitations. And variability of the data among the sources is concerning. For that reason, it would be a good idea to take random samples of it and verify accuracy. Outliers should be cleaned from the data, and certain sources eliminated. And finally, it is a good idea to set up a process to test the robustness of the prediction models to errors in the data, in order to be able to establish a confidence interval for the estimates.

Reviewer 2: Data sources are good. Can shippers with good data on their carriers use that in the tool?

Reviewer 3: The tool does collect the basic data for transportation emission inventories. Centralizing and standardizing carrier performance data is of immense value to both shipper and carriers. This tool fits perfectly with those goals. However, in order to become a full-blown benchmarking and reduction analysis tool, it needs to keep track of two key measures of the carrier that are currently not part of the tool: empty miles and utilization at the lane level. A "carrier" does not provide homogenous service to all of its shippers. The current tool allows for a shipper to get an overview of the performance of the carrier across all of its operation, but not on its specific lanes/operations. Reduction decisions are taken at the lane-level, not at the carrier level. Thus, the current measurement & reporting approach of carrier level emission factor is NOT compatible with a full-blown reduction analysis tool. It provides first-level guidance for initial discussions (are my carriers mostly bottom performers? Why?) and for modal shift where significant reductions are achievable and higher lane resolution won't make a difference in decision-making. It may also be used as a first-order benchmarking tool (intermodal vs. truck composition, SmartWay top performing carriers), but in order to become a complete shipper benchmarking it needs more details of shipper side (e.g. shipment level information, volume, weight, network structure).

Reviewer 4: Given that all truck emission factors, by fleet category and performance bin, were developed with MOVES2010, the shipper tool relies on the best available emission factor data for SmartWay carriers. One concern is the assumption that all non-SmartWay carriers would fall under an 11^{th} category. I understand that the goal is to encourage shippers to use more SmartWay carriers, but to the extent that shippers would be using the tool to estimate their emissions inventory, assigning a very conservative number could overestimate their inventories. In terms of tool outputs, time-series outputs would be beneficial for shippers to evaluate how they improve over time. Shippers would likely be interested to compare themselves against their market segment average, so some comparative charts showing rankings across a specific industry segment would be powerful tools. Under carrier performance, it would be informative to compare the performance of the carriers a shipper

uses, as well as the emissions savings from using SmartWay carriers (as opposed to non-SmartWay carriers).

Reviewer 5: The "over time" aspect of the tools is key. It also appears to us as uncertain. A regular, likely annual updating of the emissions bins will be vital to tracking actual emissions performance over time. This review process should adjust the population within a bin and the parameters of the bins themselves. Such a process will enable the smartway shipper tool to help its member shippers track performance over year; strengthen the responsiveness of carriers to adopting lower-carbon solutions, and keep up with mandatory improvements in the fuel efficiency of large trucks starting in 2014. We recommend EPA Sets a firm and clear process and timeline for updating the bins. The "time-to-time" process outlined in the review materials is cause from significant concern. The EPA Shipper tool does a very good job of providing good performance metrics for managing ghgs and air quality. If energy metrics are considered important to the success of this tool, the EPA could consider also converting data in BTUs too. Several leading shippers have established supply chain sustainability goals. These include Home Depot, Nike, Target and Wal-Mart. This tool could be better able to assist shippers with emissions reduction analysis if it enabled the shipper to enter a reduction target, say 20%, and the tool presented a couple scenarios for achieving that goal.

EPA Response:
Overall, comments to this question were positive with several comments addressing potential enhancements and or improvements to the program.

EPA intends to test the models going forward and the data to the extent resources permit. The truck carrier tool accounts for empty and out-of-route miles, adding them to the shipper tool would be duplicative. One reviewer remarked that a lane level analysis would be necessary for a full-blown reduction analysis tool. While this is technically correct, this level of analysis is beyond the scope of the SmartWay program and beyond the analytical capabilities of many shippers at this stage. Enabling the tool to model lane level activity is beyond the scope of the current tool and would require EPA to devote considerably more resources to the tool, and would greatly increase the amount of data shipper partners would have to provide. SmartWay intends to provide an entry level analysis tool that provides a platform that all shippers and carriers can utilize. Over time, additional levels of analysis can be added.

The comment that assigning non-SmartWay carriers to an "11^{th} bin" could result in an overestimation of their shipper emissions inventories is well taken. However, in the absence of company fleet level data, SmartWay has elected to take a conservative approach to insure that emissions are not underestimated. If a shipper wants to better characterize their inventory, they can do so by making sure all of their carriers are providing data to the SmartWay program. This strategy helps to fulfill EPA's goal of including all carriers in its database.

Additionally, the only non-SmartWay data EPA has on carrier level emissions are national averages. A preliminary internal EPA analysis showed that 95% of SmartWay carriers have lower gram per ton-mile emissions than the national average, suggesting that it is not

unreasonable to assume that non-SmartWay carriers have higher emissions than SmartWay carriers.

A commenter suggested that it would be beneficial for shippers to be able to see how their emissions tracked over time, or against a specific market segment. Shippers will be able to accomplish both these suggestions as they participate over time and by comparing their results via their NAICS code with other shippers with similar NAICS codes.

2. Is it clear exactly what data point is required for each field? Are there any additional definitions or guidance we should add or clarifications we should make to ensure consistent reporting?

   Reviewers 1, 2, 3, & 5: Yes.

   Reviewer 4: Under "Shipper Strategies", it would be helpful to emphasize that the reduction percentages apply to an entire mode category. In future versions, allowing specific strategies for fleet categories would be an important improvement.

3. Are the underlying equations in the tool sound?

   Reviewer 1: The equations are logical. It would be good to test the estimates against control data.
   Reviewer 2: NR
   Reviewer 3: Yes.
   Reviewer 4: The equations included in the technical documentation seem straightforward, so no comments there.

4. Is our guidance on populating the data source description fields comprehensive and reasonable? Please offer any suggestions for additional data sources shippers might use, along with your suggested ranking of data sources in terms of quality of the data. Are there any additional descriptions or guidance EPA could give that would improve the quality and consistency of the information shippers provide in the data descriptions tab?

   Reviewer 1: Yes the User's Guide is clear. A good analysis would look at variability in the data, and in particular evidence of outliers. It may be appropriate to cleanse some data sources, and perhaps even eliminate others. Everything rests on the quality of the data. Is there some way to screen the data for entry errors or data that is inconsistent with other sources. Perhaps an alert could be tripped when the information fails a simple accuracy screen.

   Reviewer 2: NR

   Reviewer 3: Yes. The Calculator Tools are a good idea to document the progress of shippers. For future versions the tool should allow more details (e.g. lanes affected) as well as input the estimated reduction by the shipper and not only a % value calculated from the blended emission calculation. There is a high risk that shippers will confuse the percentage reduction

of the project (e.g. certain carriers or lanes) with the percentage reduction for the business unit that is the one to input in the spreadsheet. Examples should be provided to avoid this type of mistakes.

Reviewer 4: In terms of ensuring consistency, additional information could be provided in terms of the consideration of empty mileage, and that the ton-mileage data should only include payload (and not equipment weight). It would also be beneficial to be explicit about whether tons mean short tons or metric tons. Short tons are the default in the U.S., but there are many foreigners who might assume metric tons.

Reviewer 5: Yes, the guide book is clear.

EPA Response: The truck carrier tool has accuracy screens, as the commenter recommended, triggering alerts when values that are out of range are entered. We will develop limits for the shipper tool as well as we get data to support them. Ton-mileage data currently only includes payload weight. A metric version of the shipper tool is currently under development. Examples and additional guidance will be developed to address reviewers understandability comments.

5. What are shippers' most common sources of distance data? For shippers that cannot obtain mileage or ton-mileage data on their shipments (from truck, rail, or multi-modal rail-truck carriers), how would you recommend they estimate miles and ton-miles for each of these modes?

   Reviewer 1: I would expect it would be a good TMS (transportation management system). Of course, such data and data bases are for sale, and some may be using that.

   Reviewer 2: They should have this information based on invoices and other documentation (e.g., shipping manifests, bills of lading). The shippers should be able to get this information from their carriers if they don't record or track it themselves. However, is it possible to add some sort of calculator into the tool (or future versions) into which they could enter various origins/destinations, product shipped and number of shipments to calculate the miles and/or ton-miles? They may not know the totals but might have the components to calculate the totals, and if the tool itself had a screen to enter this information, it might make it easier for the shipper to have the activity data all in one place.

   Reviewer 3: PCMiler, MapPoint and Google Maps are the common sources for distance data.

   Reviewer 4: I haven't looked at such tools in a while, but PC-miler used to be the main tool before Google came into the picture.

   EPA Response: An earlier test version of the tool had a calculator that could translate results from one metric to another based on available shipper data via freight density and/or distance data. This feature could be added back in to a future release.

6. Can you offer any suggestions regarding existing approaches to or research on estimating the emissions impact of shipper strategies (i.e., operational strategies to reduce weight and VMT such as distribution center relocation and better packaging) that could help us to develop better guidance and/or tool features to improve the robustness of the estimates in future versions of the tool? (see Shipper Strategies Tab in the tool)

   Reviewer 1: In addition to better package design, fundamental product design could be a huge factor. Are design engineers incentivized to reduce weight and volume, or do their incentives deal exclusively with material/labor cost and quality. Unfortunately, I believe it is the later, which ignores transportation cost, and emissions issues. In addition, network redesign to streamline the flows in a shipper's distribution network could have a major impact on miles driven and thus emissions.

   Reviewer 2: The only other shipper operational strategy I can think of is obtaining higher efficiencies by requiring technology changes on the part of the carrier. I assume that this is accounted for in the carrier tool for carriers. However, a shipper might actually require a carrier to change something on their equipment or perhaps institute no idling policies at their location. These would not be a miles or weight removed option, but they might reduce fuel usage and emissions. Something like this should be added as an option in future tools.

   Reviewer 3: Research at MIT and TUE (master level thesis), plus an upcoming report from ICF and EDF (to be released by the end of the year) include examples. The main challenge is the "robustness" of the analysis.

   Reviewer 4: I understand the uncertainties associated with estimating emission savings from operational strategies, but the assumption that a reduction in weight is proportional to a reduction in emissions is an important pitfall. There are tools available to estimate the impacts of weight reduction on fuel efficiency (e.g., PERE). MOVES could be used to estimate that, but I believe it would be a lot more complex than using PERE.

   Reviewer 5: On suggestions for estimating the impact of shipper strategies, EDF is currently working on a series of case studies of operational practices currently being deployed by leading shippers. Most of these will contain emissions reduction data. Of the strategies we will likely highlight, two are missing from the EPA list. Those are collaborative distribution approaches (which could be a sub part of removing miles from the system) and inventory control procedures (which can enable mode switching). We will be happy to share these with the EPA as they are finalized. In the meantime, we have found industry trade press outlets to be a great source for information on the potential savings from these and other operational strategies. One strategy the EPA lists, "Larger vehicles or multiple trailers" seems more like a carrier strategy. As for the tool features themselves, we recommend separating this section completely from the analysis of existing emissions footprint. Presumably, if the shippers are currently deploying any of these strategies, they would be accounted for in the data from the carriers. Thus, there is the potential for double counting as currently constituted. Rather, this section could be separated out as a scenario application that explores future opportunities.

EPA Response: We look forward to seeing the forthcoming reports and case studies the reviewers highlighted. The strategy of using larger vehicles or multiple trailers is often used by carriers, however some shippers are shipper-carriers (i.e., they operate their own fleets), and in other cases the shippers control the trailers, so this strategy does pertain to some shippers.

7. Is there a feasible methodology or guidance EPA can give shippers to include repositioning, empty, and out-of-route miles in their emissions inventories?

   Reviewer 1: Most firms strive to reduce empty miles, especially with diesel at $4/gallon and climbing. Therefore, I believe empty miles will continue to decline over time since companies are economically incentivized to eliminate them.

   Reviewer 2: NR

   Reviewer 3: The suggested approach of: emissions adjustment factor = Carrier fleet odometer mileage / Miles invoiced to shippers, is not correct since the empty/out-of-route miles are a "network" metric and is difficult to implement it to the "lane" level unless the fleet is private or dedicated. Also, emission factor estimations are already using an embedded percentage of empty miles and will need to be revisited to fully support this functionality. The closest methodology is the one that is used for lane-biding (see work from Sheffi and Caplice in combinatorial auctions as a reference). The upcoming thesis of Tony Craig will include some suggestions on how to adapt this to GHG emissions.

   Reviewer 4: The NCFRP Report 4 study has some relevant information on that.

8. Do the illustrative industry average emission factors for truck and rail appear reasonable? Do they appropriately reflect the best available data? Are there additional data or sources of data that should be considered? (For details on these factors, see both the Technical Document as well as the separate document included in your peer review packet entitled, "Summary of Findings and Proposals from Research on Average U.S. Freight Truck and Rail Emission Performance Metrics")

   Reviewer 1: The factors look reasonable. There appears to be good progress in the evolution of the estimates and data sources available. I counted 15 sources of data in Table 1 of the research project write-up. Impressive on the one hand. On the other hand, I see on page 4 of the same document that there is a high variability in the gCO2/ton-mile factors among the data sources, which raises a concern. Over time, better prediction models may take into account more variables, such as the average type of road conditions, area of the country, weather conditions, state of emissions control equipment, etc. Experimental design may someday be a useful tool to use in determining which variables and which interactions between certain variables most impact emissions. Expertise in Design of Experiments should be applied to this effort.

Reviewer 2: The estimates of industry averages seem to be sound. It is unfortunate that the most recent ton-miles are from 2002. It would be nice to have more current data as so much has changed in the demand for freight moves (both up and down) in the time since then. However, I understand the constraint with getting these data.

Reviewer 3: Both numbers appear reasonable. However, there is still a significant gap between bottom-up numbers (usually in the order of 80-100g / ton-mile when a shipper looks a lane individually) vs. the selected top-down number for trucks. The main difference comes from the impact of truck utilization and empty miles: bottom-up numbers are explicit in the utilization and empty-mile calculations, while top-down are explicit. The documentation is clear about this, but needs to be more explicit about these assumptions.

Reviewer 4: I understand the need (from the shipper's perspective) for an overall average emission factor, but such factors are typically meaningless. For example, the ratio of fuel efficiency between truck and rail can vary from 1.5 to 6, and average emission factors mask those nuances. A better analysis would be to "force" the user to choose one of the nine fleet categories, and provide average factors for each of those nine categories. MOVES should have the capability to generate fleet-specific EFs by configuring average VSP for each fleet category. The variation of EFs for rail is even wider than for trucks, making an average rail factor even more meaningless than for trucks. "Forcing" the user to choose a commodity category, which could be associated with an equipment type, would make the comparison a lot more meaningful (without requiring a significant amount of effort to develop the EFs for each category). The ICF/FRA study has relevant information on that. To generate truck g/TEU-mile factors, it would be more accurate to use VIUS2002 to estimate the average volume of a truck than to assume the dimensions of a 53' truck.

Reviewer 5: The default truck numbers are significantly lower than those reported in the recent US DOT report "Transportation's Role in Reducing U.S. Greenhouse Gas Emissions." The document, "Summary of Findings and Proposals from Research on Average U.S. Freight Truck and Rail Emission Performance Metrics," presents a strong case as to why the numbers used by the DOT might be too high for the Smartway tool. However, it doesn't adequately explain why the data point used in this tool (which is on the very low end of the distribution) is the best available option. As for alternative data sets, I would encourage EPA SmartWay to examine data from its carrier members. Given the large population of members and the multiple years of data, the EPA likely could get a decent starting point metric from the average performance of carriers as they join the SmartWay program.

EPA Response: EPA chose its proposed factors based on a variety of factors including robustness of supporting data. The MOVES Model is regarded as the best source of highway emission data and is used by state and local authorities for planning purposes. Hence, the MOVES factor was proposed. We agree that data from SmartWay partners can provide an excellent basis for default emission factors, and we will be looking to use these data in future years as we gain more years of data from the new truck carrier tools. SmartWay hopes to use company fleet specific emission factors as much as possible, as soon as possible because it understands the limit of average national default factors. SmartWay does intend to develop intermodal versus bulk freight factors for rail on a fleet basis.

9. Are the emission factors for the air and marine modes which we reference in the Technical Document reasonable enough and supported by robust enough data for shippers to use in the modal shift tab, or is more research needed on these modes?

   Reviewer 1: More research is probably needed here, although the estimates are clearly better than nothing. It would be great if an experiment could be designed to test the accuracy of some of the estimates.

   Reviewer 2: NR

   Reviewer 3: Both BSR and IMO are respectable sources, and will probably have the wider set of data. I personally believe both of them may benefit from some research, BUT, given the level of resolution of the EPA SmartWay Tool for Shippers and the order of magnitude difference between modes, the proposed numbers are adequate for this version.

   Reviewer 5: On ocean carriers, the BSR data set appears robust. We do encourage its use for ocean. This set might be more useful for shippers than IMO data set, as shippers are likely to have data on routes and number of TEUs. For the barges, the TTI data is good starting point. However, it would be ideal to have data from multiple sources. The air freight data seems low. It is significant different than the data presented in the DOT report Transportation's Role in Reducing U.S. Greenhouse Gas Emissions: Volume 1, 2-20.

10. As you will see in the Technical Document and Emissions Footprint Tab in the tool, we are planning to provide "bin-level" truck carrier emissions performance data to shippers. Is our approach to developing this bin-level data – including our selection of carrier categories, presentation of the bin #, and presentation of average factors from bins (representing equal ranges of the given emissions metric) – appropriate and helpful in terms of supporting shippers' evaluation of carrier emissions performance? Please note that the carrier data provided for this review is hypothetical and does not reflect the emissions performance of any actual carrier.

    Reviewer 1: This looks reasonable. The bin data appear to be granular enough to be useful. Also, the sample size in each bin also seems reasonable.

    Reviewer 2: NR

    Reviewer 3: I think the bin-approach is adequate and will be helpful for shippers. The "11th" bin concept is confusing. I suggest using a simpler explanation for non-Smartway carriers: they are all assumed to be in the bottom 5% percentile of the distribution, and associating a specific emission number for that range (mid point).

    Reviewer 4: Yes, I think it's a simple and useful way to provide carrier performance data without compromising carrier's confidential information.

Reviewer 5: The development of bins was a good idea and likely better captures actual performance than a straight ranking (which would have considerable uncertainty). The distribution of the bins based on emissions level rather than carrier performance makes sense too. It is objective. It is also clear what level of performance carriers need to undertake to improve a bin. As the tools goes forward, a regular, clear updating process for the bins parameters will be key. Also, the more frequent adjustments of the carrier populations within the bins, the stronger the market signal for better environmental performance.

EPA Response: We agree that the 11th bin concept needs to be replaced with an explanation that is easier to understand and we appreciate the suggested alternative. We also agree that the process and timeline for updating the bins should occur on a regular schedule and that the schedule and process should be clearly described to the partners. Partners will submit data annually and SmartWay proposes to update the bin structure every three years.

11. We are in the process of re-evaluating our approach to creating a single, composite emissions performance rating for shipper partners. As part of this research we are considering a new way to evaluate shipper emissions performance that continues to reflect both the amount of freight they ship with SmartWay carriers and the emissions performance of those carriers. We are considering rating each truck carrier by their "bin #" (1-10), weighting the truck carrier's g/mile and g/ton-mile bin # equally, and continuing to incorporate both CO2 and criteria pollutant performance into the truck carrier's rating (although we will likely weight CO2 more heavily than we have done in the past to compensate for natural fleet turnover to cleaner 2007 and newer trucks). Shipper ratings would reflect carrier ratings. We welcome any suggestions you have on creating a single rating for overall shipper emissions performance.

    Reviewer 1: A single, composite emissions performance rating for shipper partners is a worthy and impressive goal. I would make sure you state your assumptions very clearly. I would also look for ways to validate the model with actual results. Perhaps you could also state a confidence interval for the estimates, so as not to mislead users into thinking the estimates are more accurate than they really are.

    Reviewer 2: NR

    Reviewer 3: I do not think that composite emissions at the "g/ton-mile" bin work for shippers. Shippers have a completely different set of incentives and dramatically different distribution products, network topologies and service constraints that will make this figure meaningless and highly controversial. On the other hand, using bins tailored to carrier participation (e.g. % of SmartWay carriers, % by mode) will help as long as is reported by industry type.

    Reviewer 4: A potentially simpler method would be to consider a shipper's average emissions per mile (or per ton-mile), and base the shipper ranking on this metric.

    Reviewer 5: We would rather the EPA rate shipper performance only on environmental

performance. The percentage of freight sent with SmartWay carriers clearly matters to the program. Ultimately, though environmental impact should matter most. The EPA could consider two separate rating and award systems. One that is best on performance. The other on the shippers use of Smartway carriers or effort within the Smartway program. Such as dual ranking system wouldcreate potential for shippers to pressure non-smartway carriers on their environmental performance (likely leading to increased participating in the Smartway program); and would avoid penalizing shippers with unique routes with limited carrier options.

EPA Response: We agree that at this time shippers cannot be directly compared on a gram per ton-mile basis. We are exploring ways to refine our rating system by separating shippers by industry type (using NAICS codes or some other indicator). Regarding the comment that we should adopt two rating systems to reward both environmental performance and utilization of SmartWay carriers, we do plan to expand our rating system beyond just utilization and consider also factors like possibly improvement per mode and overall improvement. SmartWay intends to evolve the tools over time as we collect more and better data.

12. We are considering several options for giving shippers rail and multimodal carrier g/mile performance data in future versions of the tool (currently, the tool only presents g/ton-mile data for rail and multimodal carriers because robust rail carrier-specific g/mile data is not currently available). These options are summarized in the attached paper, "Options for Treatment of Rail g/mile in SmartWay Tools." Please comment on the general concept of providing g/mile performance data for rail and multimodal carriers in the shipper tool, the strengths and weaknesses of each option outlined in the attached paper (please indicate which option you feel would be the best approach and why), and any additional methods you recommend keeping in mind that SmartWay will also include air and marine modes in the near future.

    Reviewer 1: I read the material on Option 1, and the 1A through 1E variations, as well as the short description of Option 2. It is a worthy and impressive objective to provide a tool to support cross-mode emissions impact comparisons. It is quite difficult to comment without any description of how you will validate each option for accuracy. Option 1A is apparently the only one for which the EPA has data to implement. Yet you accurately state its limitations, which appear to be significant. The other versions of Options 1 apparently have feasibility limitations. For these reasons, I think you are stuck with Option 2 for now. Not all bad.

    Reviewer 2: I definitely think it is important to provide g/mile performance data to shippers for two reasons: 1) more and more shippers are using multimodal shipping to improve efficiency in their supply chain, and 2) carriers believe not having this is detrimental to their business. I think Option 2 is the best option for this treatment as the carriers can provide more specific data than using an overall industry-wide factor. However, I think allowing for options would be good. One option could be #2. However, if a carrier didn't have information, then perhaps a "representative rail company" factor (option 1c) could be used as a default. I also think that shippers could provide a conversation factor as well since shippers

that use multimodal transportation should have data on the amounts (weight or volume) of freight that traveled via truck versus rail for specific multimodal shipments and therefore should be able to calculate the conversion for these moves.

Reviewer 3: In general, I believe that g/ton-mile is the right level of analysis and should be used to derive any g/mile figure. Of all the options outlined, Option 2 is the more robust. If possible a refinement similar to Option 1B will be desirable, but one of the operational challenges of a company shifting modes to rail is precisely, the fact that containers are of different sizes, cargo is handled differently, etc; over time, solutions will be developed and the line between "truckable" vs. "non-truckable" may change.

Reviewer 4: The variation of CO2 emission factors by rail operator only is not a good classification. The main determinant of fuel efficiency is equipment type/commodity, which should be information available to shippers. The ICF/FRA study provides more information on how rail fuel efficiency varies across equipment types. If the classification by rail operator has to be kept, isolating coal shipments from the average would significantly improve CO2 emission factors, since coal is responsible for a large share of rail movements in the U.S. and is also disproportionally high in terms of fuel efficiency when compared to other commodities.

Reviewer 5: We are concerned about the variability inherent in data for multimodal carriers. Could the tool ask for specific percentage of miles per mode and use mode-specific coefficient? For the rail analysis, a geographic analysis for rail (similar to the approach used be BSR Clean Cargo data) might be more useful. Also, the EPA appears to be holding rail carriers to a higher standard than it holds truck carriers. While it is clear that this is possible given the limited number of rail carriers and the public availability of rail data. It is still inconsistent. Also, given the lag time needed for rail carriers to improve environmental performance, we worry that the current set-up of the Smartway tool will not reward improvements in performance nor send a strong marker signal for better performance. Finally, it seems inherently unfair that the "other" category is given a higher average than others by default. Could the EPA require carriers in the "other" category to provide specific data in order to avoid being given a lowest performer metric?

EPA Response: SmartWay agrees with reviewers that it is important to provide the same metrics for all modes. SmartWay also agrees that a direct company fleet to fleet comparison is the best method for developing equivalency factors. SmartWay believes that the data to do this for rail will be available soon. Until then, SmartWay plans on using a conversion factor based on ton-mile as the primary method wit ha volume based conversion as a backup if shippers do not possess the necessary weight data.

We are aware of the effects of different equipment types and commodity types on rail efficiency, and we are considering ways to refine how we look at freight. One possibility we are considering is to separate bulk freight from intermodal. We recognize also that there can be geographic differences in rail efficiencies. Class 1 railroads operate in different geographical regions, hence geography is taken into account to some extent by looking at the Class 1s separately. Reviewer 2's comment about the importance of providing ram per mile

factors to shippers reflects what EPA has also been hearing from SmartWay shipper partners. It is helpful to have that confirmed independently.

13. Is the Technical Document adequate to understand the tool?

    Reviewer 1: Yes, good job.

    Reviewer 2: The accompanying documents are clear and useful.

    Reviewer 3: Yes.

    Reviewer 4: The content is adequate, but if the structure of the document mirrored the structure of the tool, it would make the document more intuitive.

14. Is the User Guide appropriate and useful for understanding the tool?

    Reviewer 1: Yes, good job.

    Reviewer 2: Overall, the user guide is a great reference and very understandable.

    Reviewer 3: Yes.

15. Is the graphical user interface appropriate? How can it be improved?

    Reviewer 1: Looks good to me. It can be improved by asking users for their suggestions after they have stated using it.

    Reviewer 3: Not an expert in GUI, but it is adequate for the platform of choice (Excel).

    Reviewer 4: The graphical user interface is excellent and very intuitive. My only minor comment is to add some space (under shipper strategies) between "Select Activity:" and "Pick an activity"" tabs.

16. Is the terminology and nomenclature in the tool clear and accurate?

    Reviewer 1: I found it to be clear, and I assume accurate.

    Reviewer 2: Clear and useful.

    Reviewer 3: Yes.

    Reviewer 4: Yes.

    Reviewer 5: Yes, the terminology and nomenclature in the tool is easily understandable. One semantics suggestion, though. I would recommend EPA replace the phrase "low-emissions carrier" in the guidance document with "lower-emissions carrier." This change will help

illuminate for shippers (and carriers) that the bounds of what is considered "low-emissions" will change over time. It also implies ongoing improvements are needed even among current leaders to retain status as a lower-emitting carrier.

EPA Response: We appreciate the suggested terminology "lower emissions carrier" and will use it in future releases of the tools and supporting materials.

17. What additional features would be useful to include in the tool?

Reviewer 1: Your plans for additional features appear to be good. On the other hand, I think you would be better served by devoting your resources to improving the accuracy of the estimates vs. providing additional features, unless the features do in fact relate to accuracy improvement.

Reviewer 2: You provide instructions to enable macros for Excel 2003 and 2007. There are several people (myself included) using Excel 2010. You should provide instructions to tell the user to simply Enable Editing – a button that appears when you first open the Excel file. Then the user should Enable Content – a button that appears after enabling the editing. This then enables macros. Mac OS is not supported. Is this planned? It would be helpful to provide an estimate of if and when this might happen. Part II references video tutorials as well as additional help aids planned. What are these additional aids (presentations, workshops)? When is "later in 2011?" It would be helpful to provide a time estimate for shippers. The required information screen is helpful. I suggest you add a button that prints the screen so that the user has the option to have a hard copy of this handy to remind them of the specific information they need to have.

Reviewer 3: Direct connectivity with TMS systems and carrier billing systems, but the Data Upload functionality is close enough. Did not test this feature but this needs to work very well for large shippers.

Reviewer 4: See answer 1.

EPA Response: The latest updates to the User Guide include the instructions for Excel 2010 users. We appreciate the comment about stating specific target dates when announcing coming updates and this is something we usually do when communicating with our partners. Resources do not currently support a direct MAC version, however it is SmartWay's understanding that MACs can operate Window based programs at this time.

18. As time permits, please evaluate the tool itself for usability.

Reviewer 1: Looks good, but it's hard to tell when it's not being used under real conditions.

Reviewer 2: Not evaluated.

Reviewer 3: Not evaluated.

19. Please provide any other recommendations that could improve the utility of this tool to assess the emissions footprint of shipper supply chain freight transport operations and establish common industry emissions performance benchmarks.

    Reviewer 1: I just think over time, you need to set up a process to validate the level of accuracy of the estimates.

    Reviewer 2: Not evaluated.

    Reviewer 3: Not evaluated.

20. Please share any thoughts, recommendations or perspectives on how a tool such as this may most effectively be utilized as a carbon accounting and reporting resource, and its applicability to existing protocols such as the GHG Protocol (Scope 3 guidance) and Carbon Disclosure project, among others.

    Reviewer 1: This totally depends on the tool's level of accuracy.

    Reviewer 3: The data collected through the SmartWay program is the most accurate information for North America on road transportation. As such, it is directly applicable for all existing reporting protocols: GHG and CDP. Companies should be encouraged to use the transportation emissions from this tool directly into their inventories. However, since the SmartWay tool doesn't divide emissions by "Scopes" this will create some extra work. This should be easily mapped for SmartWay carriers, but not for non-SmartWay carriers that are blended. The transportation emissions will not be suitable for product-level given it is not life-cycle centric (for example for Carbon Trust analysis).

    EPA Response: Most all transportation emissions should fall into scope three.

Additional Comments

Overall, I believe the Shipper Tool accomplishes its purpose to assist shippers in their evaluation of their and their carriers' emissions performance. The tool is easy to use and navigate. The accompanying documents are clear and useful.

There are several places in the documents where it is mentioned that something will be done 'in the future' (e.g., g/mile rail performance, adjustment factors for empty miles, blank template for data upload, needed internet connection). This is vague and led me to wonder "when?" each time I saw this. I suggest offering a summary document (perhaps a table) that describes what was changed and is offered in the current version over the original and then a list and brief description of what is being considered for the next version and the roughly estimated timing of this. If an estimate is not known, then perhaps the "future" change should not be mentioned at all. Something like this will set the shippers' expectations (rather than letting them "guess" when the next change might occur).

In model, if "international" is only rail or truck, that should be called out more. Assumption could be ship would be included. For rankings, a reminder of the scale would be helpful, i.e. Bin 6 out of 10. On Modal shift page, Total Results (ton/yr) provides same results regardless of the number entered in the "To" field. On the Emissions Summary: Can EPA add an aggregate row?

Summary

EPA appreciated the comprehensive evaluation of the shipper tool by peer reviewers. As noted, EPA intends that the SmartWay partner calculator tools be updated periodically to reflect the most up-to-date data, methodologies, and assumptions. The peer review panel has provided a number of suggestions that we will work to incorporate into future releases. We note with pleasure that no reviewer noted major deficiencies in the tool and that all felt it is ready for use as is.